

PATENT APPLICATION TRANSMITTAL LETTER

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

Transmitted herewith for filing is the patent application of:

Gadi Mazor and Ron Maor

for INCOMING FACSIMILE ROUTING USING TEXT AND IMAGE ANALYSIS

Enclosed are:

- (X) 9 pages of specification and claims.
- (X) Abstract
- (X) 4 sheet(s) of Informal Drawings.
- (X) Declaration and Power of Attorney (UNEXECUTED)
- ( ) Statement to establish small entity status of  
Small Business Concern under 37 CFR 1.9 and 1.27.
- (X) Assignment (UNEXECUTED)
- ( ) Preliminary Amendment
- ( ) A check in the amount of \$\_\_\_\_\_to cover the filing fee.
- ( ) Any filing fees or presentation of extra claim  
fees may be charged to Deposit Account No. 05-0649  
(Eitan, Pearl, Latzer & Cohen-Zedek)

CLAIMS AS FILED

SMALL ENTITY

OTHER THAN A  
SMALL ENTITY

FOR	# FILED	# EXTRA	RATE	FEE	OR	RATE	FEE
BASIC FEE				\$345.00			\$690.00
TOTAL CLAIMS	2-20		x\$ 9	\$		x\$ 18=	\$
INDEP. CLAIMS	2-3		x\$ 39	\$		x\$ 78=	\$
MULTIPLE DEP. CLAIM PRESENT			x\$130=	\$		x\$260=	\$
				\$345.00		TOTAL	\$

Respectfully submitted,



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Docket No. P-2190-US

## **INCOMING FACSIMILE ROUTING USING TEXT AND IMAGE ANALYSIS**

### **FIELD OF THE INVENTION**

The present invention is directed to systems for atomically routing incoming facsimiles (faxes) to their intended recipients. In particular, the present invention is directed to methods and apparatus for automatically routing incoming faxes by analyzing each of the facsimile (fax) pages.

### **BACKGROUND OF THE INVENTION**

It has been long desired to route incoming faxes at the fax server. Several solutions have been proposed, each with significant drawbacks. U.S. Patent No. 5,127,047 (Bell, et al.) proposes using the control section of the fax as a means for the sender to specify the recipient, as does U.S. Patent No. 5,838,461 (Hsieh). U.S. Patent No. 5,287,199 (Zoccolillo) suggests using this information and/or pre-arranged routing information stored in the processor. U.S. Patent No. 5,247,591 (Baran) uses a standardized cover sheet to state the intended recipient.

All these methods, while theoretically feasible, force the sender to use a special sending method or cover sheet. In practice, the recipient exerts little control over the format and sending protocol of faxes from different senders.

U.S. Patent 5,461,488 (Witek) describes a system with such capabilities. However, the description given skips the actual routing and gives no indication that it

can be done, simply stating that a 'program determines, from the file, a destination of the fax document.'" If the program, as implied in that patent application, simply searches the text for the name of a recipient, then the result is potentially a misroute to a person mentioned in the fax text who is not the recipient.

### SUMMARY OF THE INVENTION

The present invention overcomes the problems associated with the prior art by providing systems and methods for routing a facsimile (fax) message based on the message itself, rather than additional information which may not be present. A system for performing the present invention includes a fax server, for receiving faxes that utilizes an algorithm to automatically route these incoming facsimiles to their intended recipients. The recipients typically receive these faxes in forms including electronic mail (e-mail) on their personal computers or other e-mail receiving devices, such as Personal Digital Assistants (PDAs). The routing is achieved by the determination of routing information, automatically determined by analysis of the fax pages. The system imposes no constraints on the content of the faxes or their sending mechanism, and is thus transparent both from the sender's viewpoint and the recipient's.

The invention is also directed to a method for routing at least one facsimile page to at least one recipient with the steps of dividing said at least one facsimile page into blocks, converting this at least one facsimile page into data, isolating at least one of these blocks as a recipient block, locating the address of the at least one recipient by analyzing the recipient block and analyzing address data to determine an address

corresponding to the at least one recipient, and sending the facsimile page data to the at least one recipient at the located address.

The invention also discloses a system for routing at least one facsimile page to at least one recipient. The system includes a fax server, that includes a storage unit including an address database and a data processor programmed to divide the at least one facsimile page into blocks and convert the at least one facsimile page into data, isolate at least one of the blocks as a recipient block, and locate the address of the at least one recipient by analyzing the recipient block and analyzing the address database to determine an address corresponding to the at least one recipient. There is also a transmitter in communication with the data processor for sending the facsimile page data to the at least one recipient at the located address.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

The present invention will be described with reference to the accompanying drawings, wherein like reference numerals or like reference characters indicate corresponding or like components. In the drawings:

Fig. 1 is a block of the system of the present invention;

Fig. 2a is a sample company address book in accordance with the present invention;

Fig. 2b is a sample resulting name space in accordance with the present invention;

Fig. 3 is a sample fax with the recipient identified in accordance with the present invention; and

Fig. 4 is a screen shot of an electronic mail communication (e-mail) resulting from the method of the present invention.

### DETAILED DESCRIPTION OF THE DRAWINGS

The present invention includes apparatus and methods automatically routing incoming faxes by analyzing each of the facsimile (fax) pages. The apparatus disclosed can be used to form systems for performing the methods disclosed herein.

Fig. 1 shows a system 20 in accordance with the present invention. The method of the present invention is typically carried out by software or software means (data) executable on computing (data processing) means, such as a computer (PC), microprocessors, embedded processors, microcomputers, microcontrollers, etc.

The system is formed of a fax server 24 that receives facsimiles (faxes) from at least one fax line 26. The faxes are routed to the specific recipient computer (RC) 28a-28n ("n" representing a plurality of units), electronically linked (illustrated by lines 29) to the fax server 24.

The fax server 24 is such that preferably therein is a data processor (DP) 31 electronically linked to a storage unit 32 for storing programs and other related software, databases (one such database being a company address book 34), data, etc. The data processor 31 is electronically linked to a reading means (RD) 36, typically a OCR such as that in a package with a parser, such as ExperVision's Recognition Tool Kit, or the like, for reading the incoming fax received over the fax lines 26 and dividing the text thereof into portions, for analysis by the software, associated databases and data, in the storage unit 32, in conjunction with the company address book 34. Once this analysis

(detailed below) is complete, the routing for the fax, or portions thereof, is determined, such that the fax or portions thereof, is sent to the correct recipient computer (RC) 28a-28n, in accordance with the routing information.

The data processor 31 functions to process data input from the storage unit 31 and the reading means 36. Processing includes performing operations, preferably by executing algorithms, for performing the method of the present invention. An exemplary algorithm, typically in the form of software or data, is detailed as follows.

#### Process No. 1

Before the program analyzes any fax messages, it receives the company address book. It converts the address book into an Address Book Name Space, as detailed in our Israel Patent Application entitled: Generation Of An Address Book Name Space, filed on even day herewith, incorporated by reference in its entirety herein. Fig. 2a shows a sample 40 of the company address book 34 (Fig. 1), while a sample of the resulting name space 42 from this sample 40 from the company address book 34 is shown in Fig. 2b.

#### Process No. 2

When a fax message is received on the server, the next process is that this program deskews each of the fax pages for further processing. This is performed in accordance with the method detailed in our Israel Patent Application entitled: Method For Efficient Auto-Deskew Of Pages, filed on even date herewith, incorporated by reference in its entirety herein.

#### Process No. 3

The next process is the actual analysis of the fax. The analysis is carried out first on the first page of the fax document 46, as shown in Fig. 3. This analysis consists

of Block Classification of the fax document 46, as detailed in our Israel Patent Application, entitled: Block Classification Of Facsimile Pages, filed on even date herewith, incorporated by reference in its entirety herein.

#### Process No. 4

Based on the block classification of the fax that was the output of the previous step, blocks 50, 51, these parts corresponding to the recipient are isolated, in accordance with this Block Classification. The above detailed classification has marked block 50 as a "To Part" and block 51 as a "Dear Part" respectively. The software now searches for the corresponding recipient in the Address Book 34 in accordance with the block classification method detailed above.

#### Process No. 5

Using all the names from the Address Book Name Space 42 that were found on the fax 46, the fax 46 is routed to the recipient computers 28a-28n belonging to the recipients with those names as per the address book 34.

#### Process No. 6

If no recipients were found on the first page of the fax, and the fax was more than one page long, Processes 3, 4 and 5 are repeated on the next page.

This series of processes achieves, conversion of the fax 46 into data and routing this data to the intended recipient, without routing to possible recipients, who may be mentioned in other parts of the fax 46. This data is typically in an electronic format, such as electronic mail (e-mail) to be received by the intended recipient on his personal computer 28a-28n, or alternately, other e-mail receiving device such as Personal Digital Assistants (PDAs).

An exemplary e-mail document 46' corresponding to the fax 46 (Fig. 3) is shown in Fig. 4. This document 46', shown as a screen shot, shows the e-mail message that corresponds to the fax 46 of Fig. 3, that includes an identified recipient 52 (in the "To:" space), an identified subject 54 (in the "Subject" space), a text paragraph 56 (here, the first significant text paragraph), the full text of the fax 58, and the attached original fax image 60.

While preferred embodiments of the present invention have been described so as to enable one of skill in the art to practice the present invention, the preceding description is exemplary only, and should not be used to limit the scope of the invention. The scope of the invention should be determined by the following claims.



What is claimed is:

1. A method for routing at least one facsimile page to at least one recipient comprising the steps of:

dividing said at least one facsimile page in to blocks;

converting said at least one facsimile page into data;

isolating at least one of said blocks as a recipient block;

locating the address of said at least one recipient by analyzing said recipient block and analyzing address data to determine an address corresponding to said at least one recipient; and

sending said facsimile page data to said at least one recipient at said located address.

2. A system for routing at least one facsimile page to at least one recipient comprising:

a fax server including,

a storage unit including an address database;

a data processor, said data processor programmed to:

divide said at least one facsimile page in to blocks;

convert said at least one facsimile page into data;

isolate at least one of said blocks as a recipient block;

locate the address of said at least one recipient by analyzing said recipient block and analyzing said address database to determine an address corresponding to said at least one recipient; and

a transmitter in communication with said data processor for sending said facsimile page data to said at least one recipient at said located address.

### ABSTRACT OF THE DISCLOSURE

There is disclosed a system and method for the automatic routing of incoming facsimiles (faxes) to their intended recipients. The faxes are received by a fax server and the routing information is automatically determined by analysis of the fax pages. The fax is converted into data in the fax server, whereby it is routed to the intended recipient, for example, in an electronic format such as electronic mail (e-mail). The system does not impose any constraints on the content of the faxes or their sending mechanism, and is thus transparent both from the sender's viewpoint and the recipient's.

FAX LINES

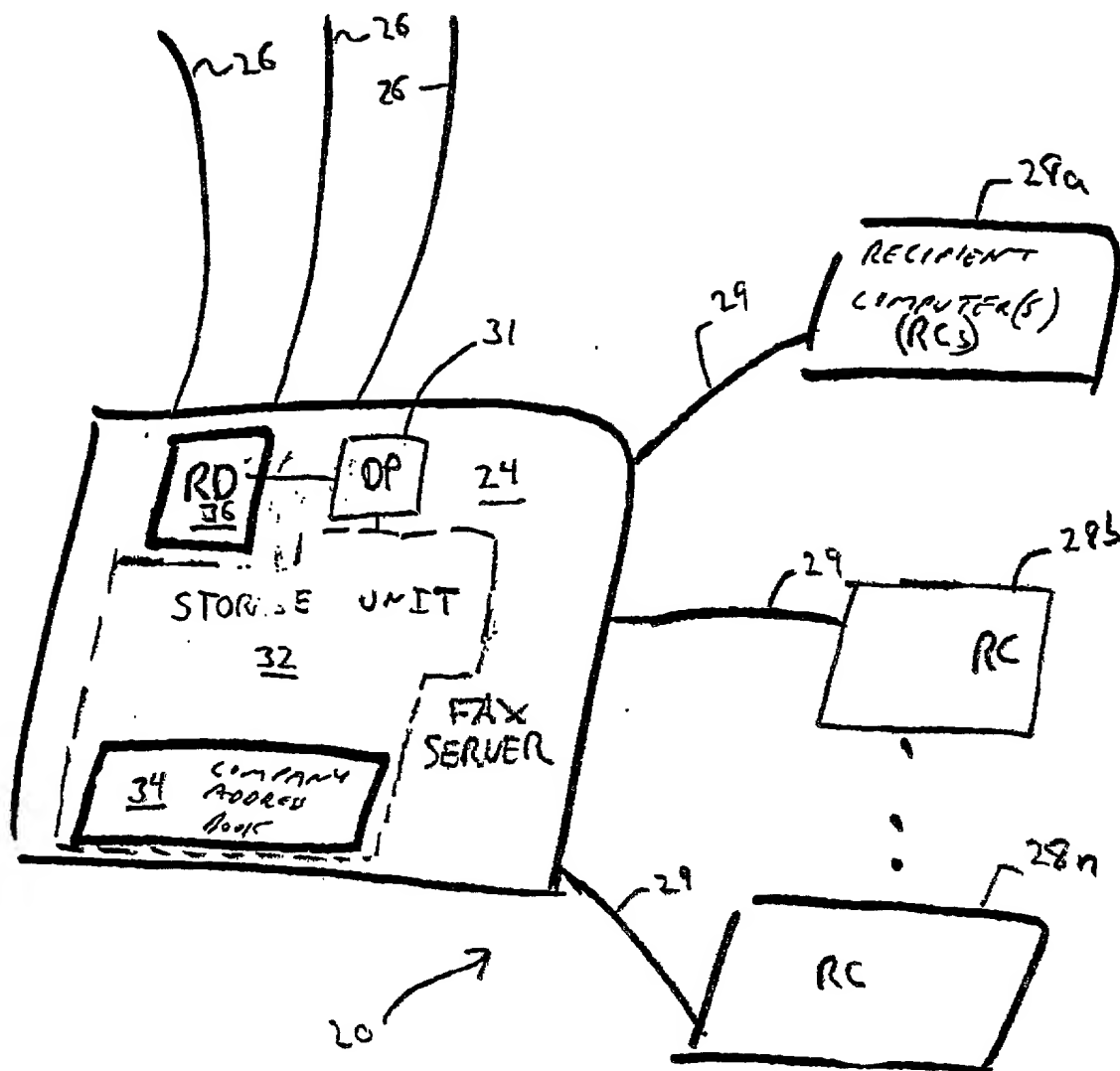


Fig. 1

First Name:	William
Middle Name:	Jefferson
Last Name:	Clinton

First Name:	John
Middle Name:	Q
Last Name:	Public

First Name:	Jane
Middle Name:	
Last Name:	Doe

← 42

Fig. 2b

William Jefferson Clinton  
Clinton, William Jefferson  
William J. Clinton  
Clinton, William J.  
William J Clinton  
Clinton, William J  
William Clinton  
Clinton, William  
Jefferson Clinton  
Clinton, Jefferson  
W. Clinton  
W Clinton  
J. Clinton  
J Clinton

...  
Bill Clinton

...  
John Q[any letters] Public


...  
Jane [any middle name] Doe

...  
...

← 40

Fig. 2a

For CAERE Corp. From: RESET, S.A. de C.V. 1-800-87 5689 p. 1 of 1

 **RESET, S.A. de C.V.**  
 Blvd. Plaz Order 2854 - 201  
 Col. Jardines de Trespunto  
 Tlalquil, Gto, 36500 MEXICO  
 Tel/Fax: 911 (524) 624-1150

50

To: Andrew Allensmith CAERE Corp.  
 Ref: Passport Reader, Model 1200

From: Salvador Garcia RESET, S.A. de C.V.

Date: 24/01/98 Pages: Just this one

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46 → Hello Andrew 51

In response to your FAX, dated today, my colleague made it quite clear that this 1200 model only reads passports. The bank is interested in this product because it has branches in cities that are considered tourist attractions, such as Acapulco, so the executive who spoke with Anthony told him that he was going to check the bank's international section to see whether there was any interest in the product. I should point out that this bank, "Banco Mexicano" was taken over by a Spanish bank, called Santander (which in the TV ads claims to have offices all over the world, including the USA). I certainly won't try to guess as to why they would be interested in this product, your reasoning is certainly valid.

It is good to know that the reader only reads the bottom half, so that they will be aware of this. As I told Jeff, this is a very presales demonstration, however, if we do get the loaner, we plan to make some sort of video trailer with it, so that we don't have to keep asking for it everytime someone wants to see it.

Thank you for your response regarding this matter, the information about the ICAC was useful.

Best regards...

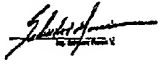
  
 Salvador Garcia

Fig. 3

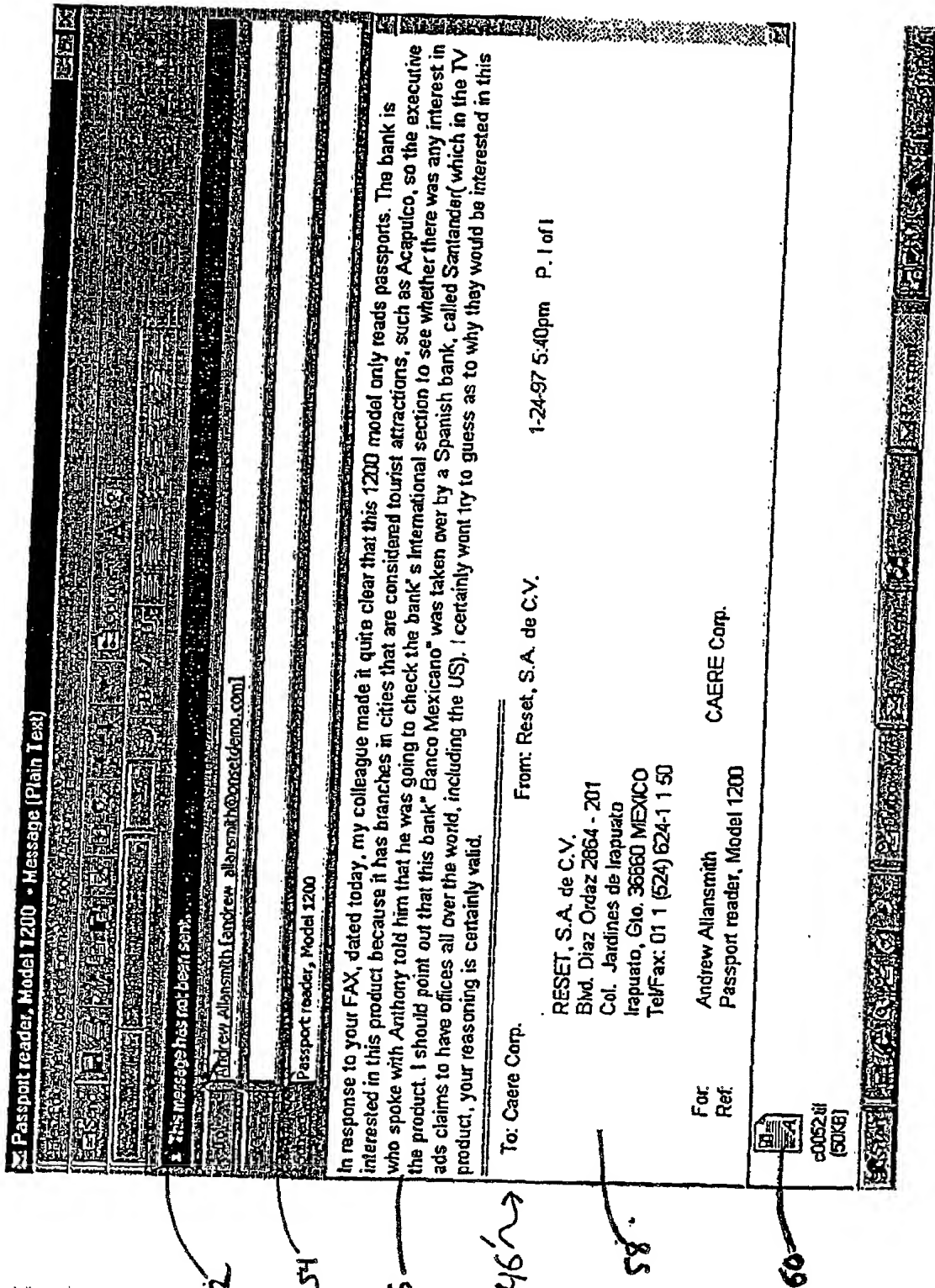


Fig. 4

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
DECLARATION FOR PATENT APPLICATIONINVENTOR(S): MAZOR, Gadi  
MAOR, RonTITLE : INCOMING FACSIMILE ROUTING USING TEXT AND  
IMAGE ANALYSIS

DOCKET NO. : P-2190-US

TO THE HONORABLE COMMISSIONER OF PATENTS AND TRADEMARKS:

As a below named inventor, I hereby declare that:

This declaration is of the following type: (check one applicable item below)

- ☒ original  
☐ design  
☐ supplemental

NOTE: If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application do not check next item; check appropriate one of last three items.

- ☐ national stage of PCT

And is a

- ☐ divisional  
☐ continuation  
☐ continuation-in-part (CIP)  
of U.S. Patent Application .

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **INCOMING FACSIMILE ROUTING USING TEXT AND IMAGE ANALYSIS**, the specification of which is attached hereto unless the following is checked:

☐ was filed on as United States Application Number or PCT International Application Number , and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 (see last page attached hereto).



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I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a) - (d) or 265(b) of any foreign application(s) for patent or inventor's certificate or 365(a) of any PCT international application which designates at least one country other than the United States of America, listed below and have also identified below any foreign application for patents or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Applications:

Priority Claimed:

<u>127982</u>	<u>Israel</u>	<u>10 January 1999</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/Month, Year Filed)	Yes	No

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

<u>                    </u>	<u>                    </u>	<u>                    </u>
(Application No.)	(Filing Date)	(Status - patented, pending, abandoned)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the National or PCT international filing date of this application.

<u>                    </u>	<u>                    </u>	<u>                    </u>
(Application No.)	(Filing Date)	(Status - patented, pending, abandoned)

<u>                    </u>	<u>                    </u>	<u>                    </u>
(Application No.)	(Filing Date)	(Status - patented, pending, abandoned)

As the inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the U.S. Patent and Trademark Office connected therewith. Name and registration number are listed below.

HEIDI M. BRUN	34,504
JEROME R. SMITH JR.	35,684
MARK S. COHEN	42,425
DANIEL J. SWIRSKY	45,148
NICHOLAS AQUILINO	24,527
JOHN L. WELSH	33,621
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Arlington, Virginia 22202

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Date: \_\_\_\_\_ Signature: \_\_\_\_\_

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#### § 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim is issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim;  
or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

- (i) Opposing an argument of unpatentability relied on by the Office, or
- (ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application;

(2) Each attorney or agent who prepares or prosecutes the application;  
and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventory may comply with this section by disclosing information to the attorney, agent, or inventor,